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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,924	10/15/2003	Manabu Aizawa	09792909-5699	7047

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EXAMINER	
WHITTINGTON, KENNETH	
ART UNIT	**PAPER NUMBER**
2862	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/685,924	AIZAWA ET AL.	
	Examiner	**Art Unit**	
	Kenneth J. Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5,6,8-13 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5,6,8-13 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The Request for Continued Examination filed March 20, 2007 and the Amendment filed February 22, 2007 have been entered and considered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3, 5, 6, 8-13 and 15 are rejected under 35 U.S.C. 103 as being obvious over Rovner (US3825823) in view Tong et al. (US5199178), hereinafter Tong. Regarding claims 1, 8 and 15, Rovner teaches:

a magnetic detection unit having three or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal intervals based on a predetermined rule in such a way that directionalities thereof are different from each another, the detection devices on a loop core having an excitation coil there around (See Rovner FIG. 1, detection coils 21-26, core 11 and excitation coil 15);

a sampling unit for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection means (See FIG. 1, item 12 and col. 4, lines 18-56);

a condition determining unit for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling means meets a predetermined condition (See FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46); and

a azimuth information output unit for outputting magnetic azimuth information based on a result of the determination of the condition determining means (See FIG. 1, item 28).

However, Rovner does not teach the particular wheel-spoke arrangement of the cores and coils with the cores and coils arranged in a thin-film arrangement.

Tong teaches three or more magnetic detection devices of a magnetic detection unit each comprising a thin film magnetic core, a thin film exciting coil and a thin film detection coil around the magnetic core, each of the coils being formed in a two layer structure, the three or more magnetic detection devices disposed in a wheel-spoke arrangement with their cores positioned to point along their axes from a common point (See Tong FIG. 9, note y-shaped core and two layered exciting coil CC and detection coils CS disposed on a substrate). It would have been obvious at the time the invention was made to modify the magnetic detection devices of Rovner in the manner as taught by Tong. One having ordinary skill in the art would have been motivated to do so because as noted in Tong the concentric-round core shape can be implemented in other core shapes, such as the y-shape or polygonal shapes, each being equivalent for used in a magnetic compass (See Tong col. 8, lines 17-39). Furthermore, making the compass or magnetic azimuth apparatus as noted in Tong using thin film techniques provides as shown in FIGS. 3 and 9 of Tong provides a magnetic detection apparatus which is small in sized, simple in manufacturing and has a high reliability (See Tong col. 3, line 5 to col. 4, line 49).

Regarding claim 3, the noted combination teaches each magnetic azimuth device comprising a magnetic core made of soft magnetic material, an excitation coil and a detection coil (See Rovner col. 3, lines 23-25 and Tong col. 6, lines 6-22).

Regarding claim 5, the noted combination teaches one excitation coil corresponding to the three or more magnetic detection devices to form one excitation coil shared by all magnetic detection devices (See Rovner FIG. 1, core 11, excitation coil 12 and detection coils 16-19 and see Tong excitation coil CC and detection coils CS).

Regarding claim 6, the noted combination teaches the magnetic detection coils have the same one end (See Rovner FIG. 1, note that all coils are connected to the common ground).

Regarding claim 9, the noted combination teaches the magnetic core comprising a material that enables provision and elimination of inductive magnetic anisotropy to be carried out with heat treatment in a magnetic field (See Rovner FIG. 1, item 11 and col. 8, lines 47-51, note also that permalloy is a well known soft magnetic material that increases magnetic permeability upon heat treatment-see Non-patent literature internet reference explaining the known heat treatment of permalloy well known since 1923 and Ihara et al., US5,028,280, see also Tong col. 6, lines 6-22).

Regarding claim 10, the noted combination teaches the sampling means switches electromagnetic conversion outputs of the magnetic detection devices, and performs synchronous detection of a switched signal with a predetermined frequency, thereby sampling a voltage change corresponding to an external magnetic strength (See Rovner FIG. 1, item 12 and col. 4, lines 18-56).

Regarding claim 12, the noted combination teaches the condition determining means supplies a trigger signal to the azimuth information output means as a result of determination if the electromagnetic output being sequentially sampled by the sampling means is a maximum, a minimum, or zero crossing (See

Rovner FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46).

Regarding claim 13, the noted combination teaches the azimuth information output means outputs a signal for switching, which is sampled by the sampling means if the trigger signal is received from the condition determining means, as information indicating an azimuth of the external magnetic field (See Rovner FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46).

Allowable Subject Matter

Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: regarding this claim, the prior art does not teach the recited sampling if the number of magnetic field detection devices is set to be 2^n, the number of switches being the same as the number of detection coils, in combination with the other features of the claim.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Kenneth J Whittington
Examiner
Art Unit 2862

kjw

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